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ABSTRACT

This discussion of the importance of psychotechnologies such as biofeedback, meditation, and guided imagery to education focuses on the potential of such techniques to expand human learning capabilities and consciousness. The work of many theorists and researchers in the fields of education, physiology, and psychology is reviewed, citing evidence that psychotechnology can: (1) augment instructional design models; (2) generate extraordinary learning outcomes; (3) provide additional cognitive strategies to improve one's ability to learn; and (4) augur a future trend in the definition of instructional technology. A list of 47 references is included. (MES)

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Psychotechnology as instructional technology:

Systems for a deliberate change in consciousness

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Psychotechnology as instructional technology:
Systems for a deliberate change in consciousness

> Human knowledge and power meet in one; for when the cause is not known, the effect cannot be produced. Nature to be commanded must be obeyed, and that which in contemplation is as the cause is in operation as the rule.
>
> Francis Bacon
> Aphorism III, Novum Organum

Francis Bacon's paradox, "Nature to be commanded must be obeyed" is a pertinent reminder that technologies work best to control nature by first understanding what already occurs as natural phenomena. Technology must obey nature if we are to benefit from it.

While the term "technology" generally brings to mind some piece of engineered hardware, tracing the etymology of technology to its Greek origins in the Oxford English Dictionary yields its root meaning: "systematic treatment of" or "art, craft". Technology then, is seen as a rational design for specific purpose.

Former Director of the Harvard University Program on Technology and Society, Emmanuel Mesthene said, "We have found it more useful to define technology as tools in a general sense including machines, but also including linguistic and intellectual tools and contemporary analytic and mathematical techniques. That is, we define technology as the organization of knowledge for practical purposes." (Teich, 1982, p. 102).

Winner (1977) defined technology by saying "in the West, at lest, the test is not so much what do you know or how elegant is your interpretation of worldly phenomena? but rather, what can you actually do? . . . Science succeeds over rival ways of knowing - poetry, religion, art, philosophy, the occult - not by its ability to illuminate, not even by its ability to organize knowledge, but by its ability to produce solid results . . . In the last analysis, the popular proof of science is technology" (p. 24).

Yet Schramm's summation of instructional technology research is replete with examples of technologies which have failed to bring about significant effects in learning (Schramm, 1977). Radio, film, television and computer, though remarkable scientific achievements in themselves, have generally proven powerless to dramatically improve one's ability to learn.

Winn (1984) has expressed some disenchantment with electronic media as instructional tools, pointing rather to the positive attributes of instructional methods which "interact with psychological processes in learners and thus have a direct influence on how they learn" (p. 31).

Technology which does not interact with a learner's thought processes is simply hardware. Yet directed thought may be considered an advanced technology. The value of any instructional technology rests on its ability to deliberately interact with a learner.

Instructional Technology research in the past usually has neglected to study the mind of the learner. Rather, teaching technologies often have been vigorously researched to determine whether any relationship existed between a stimulus such as film and some learning response. No significant correlations were generally found (Schramm, 1977).

However, the subjective mind of man has now become a respectable research topic for educators. In a review of consciousness research, Hilgard noted "the preference for the externally observable (peripheralism, the 'fingertip' psychology) against private mental experiences (centralism) led to a distaste for studying mental processes such as imagery. When consciousness began to be studied in the spirit of cognitive psychology, it was described as the "return of the ostracized," (1980, p.8). The visual literacy movement which includes such topics as mental rehearsal and visual thinking underlines this shift to looking at internal mental processes in the field of instructional technology. Perhaps as we change the emphasis of our research and examine new processes by which learners can perceive and assimilate information, we can discover additional ways to expand their capabilities.

A report issued by the Department of Health Education and Welfare addressed this issue. "The Outer Limits of Human Educability: A Proposed Research Program" It stated that various approaches have been developed to, "increase the range of these receptors and to increase the rate and complexity of an organism's capacity to assimilate experience" (Fletcher, 1978, p. 15). Also noted in the report, "there are various approaches to increasing storage, retrieval and creative synthesis powers of the organism" (p. 15). As the report stated, some approaches seek to alter our senses, "to increase the rate of input, or the accuracy of sensory discrimination" (p. 15), or, "to determine whether under hypnosis, meditation, or other altered stated of consciousness, the senses operate more efficiently" (p. 15), or, "since one's concepts, expectations, and experiences affect what is perceived . . . to provide internal categories for the material to be assimilated" (p. 15), using a technique such as guided fantasy.

Other approaches were said to, "discriminate in great detail the body's reaction to something because internal sensations often mirror something that is happening outside" (p. 15). Still other approaches involve looking inward through meditation and psychotherapy in the belief that "the world outside a person reflects what is true inside and is set up to complement it (p. 15). Additional ways to develop our capacity to process experience stated in the report were: by developing non-linear

ways of processing information through analogy, metaphor, myth and personification.

In fact, many researchers and practitioners are investigating whether it is possible to affect an individual's learning ability through psychotechnology. Dr. Jean Houston, director of the Foundation for Mind Research, said, "We have discovered, for example, that most people, given an opportunity and education, can realize more of their potentials in varying degrees. They can learn to think in images as well as in words, to practice in subjective time the rehearsal of skills, and to experience the acceleration of thought processes. They can experience cross-sensing, the self-regulation of pleasure and pain, and acquire voluntary control over some of the autonomic functions by means of biofeedback and autogenic training" (Battung, 1981, p. 15).

Dr. Tom Roberts, Northern Illinois University professor, described psychotechnology this way. "As students become aware of their own inner states, they can begin to recognize important conditions which affect their learning ability" (1975, p. 5). He then explained how relaxation training, guided fantasy, dream work, meditation and biofeedback may improve a students performance in the classroom by enabling him to enter a state of mind which is conducive to learning.

While explaining what he called "The New Copernican Revolution," Dr. Willis Harman, from Stanford University, observed that "much evidence is accumulated to support these three propositions: 1) human potential is far greater than our present models allow 2) a far greater portion of our experience is unconscious than we acknowledge and that these unconscious processes are facilitated by attending to feelings and emotions through such means as inner attention, free association, hypnosis, sensory deprivation or psychedelic drugs 3) that expectations (largely unconscious) play a dominant role in enhancing or limiting our capabilities" (1969, p. 28).

In her book, Supermind, Dr. Barbara Brown stated that "mind techniques of self-suggestion, imagery, healing powers, changing consciousness, body consciousness, inner games of sports, mind-body integration, the meaning of Zen writings, yogic meditation, and other variations on the theme of mind all signal a new perception of mind (1980, p. 7) which point to the "emergence of a human superpotential, a new mind" (p. 9).

Approaches such as these which apparently engage the psychological processes of the learner are often referred to as "psychotechnologies" (Ferguson, 1980, p. 87). Other examples of psychotechnology which Ferguson identified were: autogenic training, music, improvisational theatre, hypnosis, meditation, sensory isolation and overload, body disciplines such as hatha yoga, aikido and karate, and biofeedback.

With the emergence of these psychotechnologies, Ferguson observed, "Some eminently sane and distinguished people believe that the human mind may have reached a new state in its evolution, an unlocking of potential comparable to the emergence of language" (Ferguson, 1980, p. 67).

What more do we know of psychotechnologies? "The intentional triggers of transformative experiences are numberless, yet they have a common quality. They focus awareness on awareness - a critical shift. For all their surface variation, most focus on something to strange, complex, diffuse, or monotonous to be handled by the brain's analytical, intellectual half; on breathing, repetitious physical movement, music, water, a flame, a meaningless sound, a blank wall, a koan, a paradox. The intellectual brain can only dominate awareness by affixing itself to something definite and bounded. If it is captured by a diffuse, monotonous focus, the signals from the other side of the mind can be heard" (Ferguson, 1980, P. 85).

The governmental report "The Outer Limits to Human Educability" concurred, suggested that, "Some forms of meditation are used to 'stop the mind' to eliminate the cognitive noise or dissonance that for most of us is always present. Apparently eliminating that process opens the awareness to many other forms of knowledge that were still masked by cognition (Fletcher, 1978, p.14).

A predominant theory is that they are tools to other realms of consciousness, whether it is the preconscious (Lozanov, 1976), an altered state of consciousness (Tart, 1969), or the unconscious (Brown, 1980). Implicit to this is the assumption that other realms or states of consciousness are the source of greater creativity, problem-solving ability, supermemory, and heightened awareness.

Roberts (1981) described it this way. Human disabilities and disabilities are stronger in some states of consciousness and weaker or nonexistent in others. "As one learns to select one's state of consciousness (patterns of mental functioning), one increases the number of abilities one can learn, develop and use" (p. 106). "If someone tries to deny the importance of all different mental patterns, he is stuck with the fact that these experiences are frequently psychologically therapeutic, philosophically insightful and both artistically and scientifically creative (1983b, p. 2).

Lozanov agreed. "For example, D. Mendeleev completed his work on the periodic table of the chemical elements during a dream. A. Kekule von Stradonitz solved the problem of the structure of the benzene nucleus in his sleep; and S. T. Coleridge envisioned Kubla Khan while drugged by a medicinal potion, and then wrote this poem" (1976, p. 75).

Considering consciousness, William James, in The Varieties of Religious Experiences (1929), established it as a significant issue which is germane to the field of psychology and indirectly, education.

> Rational consciousness . . . is but one special type of consciousness, whilst all about it, parted from it from the filmiest of screens, there lie potential forms of consciousness entirely different. We may go through life without suspecting their existence; but apply the requisite stimulus, and at a touch they are there in all their completeness. No account of the universe in its totality can be final which leaves these other forms of consciousness quite disregarded. How to regard them is the question . . . At any rate, they forbid a premature closing of our accounts with reality" (p. 89).

Other prominent psychologists have investigated the work of the unconscious using psychotechnology. Some developed extensive theories which where later applied to education.

Sigmund Freud, using such techniques as hypnosis, dream analysis and free association, discovered many ways in which the unconscious influenced behavior. Freud later conceptualized the data generated by these techniques, laying the groundwork for theories of personality development. Many have applied Freud's concepts to education. Four Psychologies Applied to Education (Roberts, 1975) includes sixteen articles describing some implications of Freudian psychology for educators.

Freud's disciple, Carl Jung, also studied the unconscious, primarily through dreamwork and symbolization. But unlike Freud, he theorized that the fundamental instinct within man was not sex drive, but creative impulse (Wilson, et al, 1969, p. 333). Jung believed that claiming unconscious aspects of the self freed an individual from restricting emotions. He portrayed this maturational process as individuation. (Owen, et al, 1981, p. 117).

The same tools have been used for a different purpose. Many of the techniques of Freudian psychology which were used to explain the abnormal, have become the tools of transpersonal psychology to explore the supernormal. The evolution from Freudian psychology to transpersonal psychology, however, was partly owing to contribution from Humanistic Psychology.

Father of Humanistic Psychology, Abraham Maslow, held a, "belief in the reality of higher human needs, motives and capacities" (Roberts, 1975, p. 306). The Farther Reaches of Human Nature outlined these Higher goals. Proposing such concepts as self-actualization, self-transcendence, and peak experiences, Maslow emphasized the stages of development beyond mere survival. Humanistic Psychology emphasized the positive attributes of man. "These positive abilities are called human potentials and

humanistic educators usually focus their teaching on these abilities" (Roberts, 1975, p. 29).

Many well-respected psychologist belong to this movement. "The human potential movement is a serious, influential, and revolutionary trend, built on the work of Abraha Maslow, Jean Piaget, Erich Fromm, Alexander Lowen, and Rollo May, among others, and on the brain research that stemmed in part from work with brain wounded soldiers in World War II" (Robinson, 1977, p. 638).

Humanistic Psychology and "Third Force Psychologies" (Roberts, 1975), gave rise to transpersonal psychology, an emerging psychology which contends that human potential is extraordinary and far surpasses current expectations. The "Fourth Force" (Tart, 1975) includes the study of unusual abilities such as extrasensory perception, psychokinesis, supermemory, and experiences which relate to the spiritual nature of man. "While the humanistic psychologists tend to explore interpersonal, human relations in their search for these new potentialities, transpersonal psychologists trend toward the subjective, transcendent, and more unusual attributes" (Roberts, 1975, p. 396).

In an even broader sense, many have observed that the exploration of these new abilities represents a new view of man. This new view of man is considered to be part of a paradigm shift which challenges many traditional assumptions of Western science. Fritjof Capra, professor of physics, characterized this new paradigm in The Turning Point. Referring to unemployment, high inflation and other modern problems, he stated, "The basic thesis of this book is that these are all different facets of one and the same crisis, and that this crisis is essentially a crisis of perception" (1982, p. 15). Capra's view is partially derived from the new physics which now recognizes that "the basic structures of the material world are determined, ultimately, by the way we look at this world; that the observed patterns of matter are reflections of patterns of mind" (Capra, 1982, p. 93). Thus additional credence is given to conceptual awareness.

In The Aquarian Conspiracy, Ferguson explicated this paradigm shift as a broad social movement - cultural transformation based on personal transformation. Psychotechnology, according to Ferguson, provides the tools for personal transformation and a new view of man. She expects that this new view of man will engender radical changes in every corner of society - politics, business, and education as well.

While psychotechnology may provide tools to accomplish very specific instructional goals, others see it as much more than that. As history suggests, the function of psychotechnology varies with the user. How can psychotechnologies serve instructional technologists?

Evidence can be found to show that psychotechnology can:

a) Augment instructional design models
b) Generate extraordinary learning outcomes
c) Provide additional cognitive strategies to improve one's ability to learn
d) Auger a future trend in the definition of instructional technology

Emerging physiological evidence and theories point to the inadequacy of the information processing model currently used in most instructional design work. The evidence points to the interrelationship between mind and body and the need to design instruction which addresses this fact.

Psychotechnology embraces the idea that, "The conceptual merger of body and mind also implies that, at bottom, psychology is not all that different from physiology. Life's experiences, it turns out, alter the cellular and chemical arrangements of the brain" (Alexander, 1983, p. 83). The bodymind connection underlies many psychotechnologies. "Not only does the body reflect all the historical and present conflicts of the mind, but the reorganization of one helps reorganize the other . . . Intervention anywhere in the dynamic bodymind loop affects the whole" (Ferguson, 1980, p. 102). A discussion of body therapies noted that "mind can be seen as an aggregate of the total multisensory pictures of successive moments of now. This continuous stream includes innumerable inputs from the body, in varying degrees of conscious awareness - position, muscle tone, temperature, the condition of internal organs and processes. Thus it can be seen that the state of the body is part of mind, and it follows that changes in the body are reflected as a changed mental state" (Rappaport, 1975, p. 66).

What physiological evidence suggests that psychotechnologies may enhance learning? According to brain researcher, Marilyn Ferguson, "Meditation, chanting, and similar techniques increase the coherence and harmony in brain wave patterns; they bring about greater synchrony between the hemispheres, which suggests that higher order is achieved. On occasion it appears that increasing populations of nerve cells are recruited into the rhythm, until all regions of the brain seem to be throbbing, as if choreographed and orchestrated. The usually dissynchronous patterns in the two sides seem to become entrained to each other. Brain wave activity in older, deeper brain structures may also show an unexpected synchrony with the neocortex" (1980, p. 79).

In a recent Delphi Survey, Diane Battung identified over 45 new developments in the brain/mind revolution which corroborate the validity of psychotechnologies as instructional tools. The following is a partial list of some of the evidence available.

Some brain/mind theorists speculated that relaxation exercises may be useful by reasoning that anxiety which produces static in the brain (as shown by brain wave scans) can inhibit learning. Others conjectured that the brain may respond to music and rhythmic approaches because according to Karl Pribram's holographic theory, the brain resonates to mathematically processed frequencies. Similarly, microdynamic theorists stated that every physical material carries a harmonic and that "the brain may operate as a resonating system whereby neurochemicals in the brain are brought into symmetrical formats by the central resonances" (1980, p. 45). It has been suggested that an alternate state of consciousness may enhance one's memory by producing more endorphins (chemicals in the brain which evidently have an effect on memory) explaining perhaps why hypnosis can elicit remarkable feats of memory.

Joseph Bogen reported that information which is emotionally loaded is transmitted quickly because most information passes through the brain stem which is richly connected to the limbic (emotional) system (Battung, 1982, p. 20). This may be one rationale for using technique such as psychodrama which attempt to elicit an emotional response. A multisensory approach may be advisable because as some reported, in order for information from short term memory (electrical) to be transferred to long term memory (chemical) three or more senses must be involved. It was noted that physical therapies have already demonstrated that body movement can stimulate the brain, so such body therapies as the Feldenkrais Method and Alexander technique which appear to be effective psychotherapies may be useful tools for interacting with the mind. It was disclosed that the brain has the ability to process millions of pieces of information in microseconds so that it may be possible to accelerate learning far beyond what is usually possible.

Battung concluded her study by saying that "It was evident from the literature reviewed that developments contributed to the study by both the Panel of Eminence and participants are issues in the brain/mind revolution and are directly linked with the human capacity to learn and the processes of education" (p. 259).

Together with emerging physiological data, new theories are being developed which point to the inadequacy of current instructional design practices and the potential value of psychotechnology.

Howard Gardener, former staff member of the Harvard Project on Human Potential, raised some issues. "For one thing, like most previous approaches to intelligence, the information processing tack is studiously non- (if not anti-) biological, making little contact with what is known about the operation of the nervous system" (1983, p. 23). Instead, Gardener proposed a theory of multiple intelligences, each autonomous systems for perceiving, processing and storing information. The seven intelligences he convincingly argued are: musical, bodily kinaesthetic, spatial,

linguistic, personal, and logical-mathematical. He remarked that each intelligence appeared to have its own symbol system, i.e., that "symbol systems may have evolved just in those cases where there exists a computational capacity ripe for harnessing by the culture" (Gardener, p. 66). A reasonable conjecture may be that some psychotechnologies which introduce music, psychodrama, kinaesthetic or spatial awareness, may provide alternate ways to communicate with these other intelligences. While this is pure speculation, Gardener's theory is too suggestive to be ignored.

Norman Geschwind, Professor of Neurology at Harvard agreed that, "Other neurological evidence points to an organization of the brain which is composed of multiple systems and these different systems are often at a distance from each other and under quite different kinds of control" (Miller, 1983, p. 127). A psychotechnology such as hypnosis may enable a learner to bypass normal controls in the conscious mind - repressions, defenses, and inhibitions, and access what Lozanov refers to as the "hidden reserves" of the mind. These hidden reserves may hold lost memories and stifled abilities. Dreamwork and meditation may also avert conscious controls and enable a learner to reclaim what only exists now as a potential.

Alan Allport also stated that the mind "is best thought of as a large number of independent production systems; these computational systems operate in parallel (rather than serially) and are each specifically keyed to and activated by a certain kind of information. (Gardener, 1983, p. 28). Ivan Barzakov's program, Optimalearning, orchestrates paintings, classical music, skits, posters and stage props to suggest the same message to the student. His belief in the power of suggestion implies that although the learner may not consciously be aware of each message in the environment, some other part of him still perceives and processes it. This challenges current instructional design practice. As Wittrock has pointed out "Instruction using a single objective at a time, or an assumption that a single meaning corresponding to a meaning given by a teacher is learned is naive. A variety of organizations, strategies of information processing, and sequences of instruction for different contexts, people and subject matter seems more likely to accommodate the sophisticated multivariate processes of our brain" (Battung, 1982, p. 6).

Gazzinga held similar view. "Clinical observation of this nature lead us to speculate that in normal man there may well exist a variety of separate memory banks, each inherently coherent, organized, and logical and with its own set of values. These memory banks do not necessarily communicate with one another inside the brain. If this is true, then the only way for the organism - which is to say, the cognitive subsystem in the forefront of consciousness at any one point in time, which is the verbal system in humans - to discover its total resources is to watch itself as it behaves" (1978, p. 134). Self-awareness may be a valid instructional objective, because it can help an individual discover conflicting emotions in order to become a more integrated

person. Biofeedback may help a person become more self-aware by showing how one's heart rate and respiratory system reflects personal anxieties.

Just as research points to the validity of psychotechnology as an instructional technology, practice does as well. Many educators have reported extraordinary success in improving learner capabilities by using various psychotechnologies separately or in combination with each other. Georgi Lozanov's Suggestology Method, which includes rhythmic breathing, psychodrama and relaxation exercises, can ostensibly teach the equivalent of a two-year foreign language class in two months (Brain/Mind Bulletin Theme Pack, No. 11). Raymond Abrezol's Sophrology Method which utilizes focusing, breathing training, and mental rehearsal, apparently produced six Olympic Medal winners (Brain/Mind Bulletin Theme Pack no. 5).

Sheila Ostrander's book, Superlearning (1979), contains numerous reports of spectacular results when students were taught using these new approaches. Jean Cureau of the Lycee Voltaire reportedly achieved a ten to one speed-up in learning; students in a Naval Systems Class taught by the SALT Method (an adaptation of Lozanov's Suggestology Method) were said to learn at double speed. Dr. Donald Vannon claimed that he increased the percentage of A's in his class from 11 to 78 percent using relaxation techniques.

A host of other trainers, educators and psychologists have reported productive results from the use of the array of psychotechnologies which are rapidly becoming popularized. "Hendricks and Roberts (1977) listed over 1200 items in a bibliography on transpersonal/consciousness education ranging from esoteric religious education to biofeedback conditioning. While the results are almost uniformly good (in fact, some are amazing) . . . their anecdotal and descriptive natures indicate exciting and valuable contributions yet to be made by future educational researchers" (Roberts, 1980, p. 86).

Recent research suggests that we should look at the cognitive strategies a student uses if we want to understand how to significantly improve his ability to learn. Recent discussion of the progress of educational technology continues to emphasize that within the structure of formal education, the major variable in the learning process is the ability of the student (Bloom, 1976; Chadwich, 1979; Dillbeck, Aron & Dillbeck, 1979). Specifically, "The research indicates," said Carnegie Mellon psychologist, J. R. (Dick) Hayes, that "the differences in performance in the classroom that we observe are not so much a function of differences in I.Q. as they are differences in strategies for acquiring information" (Welles, 1983, p. 53). Gagne defined cognitive strategy as a "control process, an internal process by means of which learners select and modify their ways of attending, learning, remembering and thinking" (Gagne, 1979, p. 71). Gagne further stated "cognitive strategies have as their objects the learner's own thought processes" (p. 72).

Psychotechnologies are rapidly becoming popular practical methodologies among educators. A Stanford business course has used Zen, I-Ching, and Eastern relaxation techniques to promote creativity. An Iowa public school system has adapted Lozanov's Suggestology approach to teaching school children. Numerous other instructors have been and are, no doubt, using techniques that they have gleaned from such books as The Centering Book, The Moving Center, and Superlearning, in the classroom.

A glance at literature on classroom application of innovation teaching methods will reveal descriptions of a number of specific psychotechnologies such as meditation, biofeedback, and guided imagery with such cognitive strategies as memory, attention, creativity, and problem-solving ability.

As suggested earlier, much of what has been written about psychotechnologies has emphasized going beyond the ordinary to that which is currently extraordinary. Many have urged that an image of the future which is open to the extraordinary is crucial because it gives direction and momentum to latent possibilities (Battung, 1982; Houston, 1978). Lozanov (1976) introduced a process of "de-suggestion" in order to counteract the inhibiting influence of what is considered to be the norm. Walsh (1983) explained, "If our prevailing cultural and psychological models have underestimated what we are and what we can become, then perhaps we have set up a self-fulfilling, self-limiting prophecy. In such a case, the exploration of extreme psychological well-being, and the permeation of that knowledge in psychology and the larger culture, becomes a particularly important undertaking" (p. 10).

Thus, many see consciousness as a dominant future trend. In the preface to their college psychology textbook, authors Wallace and Fisher stated, ". . . we believe that the psychology of consciousness is in the midst of a zeitgeist, which we predict will continue through the 1980's and into the 1990's" (p. viii). Tom Roberts predicted the use of psychotechnologies as one of the future trends in education. "By the end of this decade any educator or social scientist who is unfamiliar with the research on biofeedback, meditation, psychedelic drugs, or imagery and relaxation will be as out of date as someone today who is ignorant of Freud's work with the unconscious, Skinner's operant conditioning, or Piaget's ideas of cognitive states (1983a, p. 71). In fact, an instructional technology textbook chapter titled "Future technologies of Instruction" predicted a shift from "technology as product" to "technology as process" (Heinich, p. 333).

Increasing interest and applications of psychotechnology put instructional technologists in an uncomfortable position. If, as preliminary evidence suggests, psychotechnologies get amazing results, then instructional technologists are not leaders, but laggards in what appears to be a promising trend. However, if the

techniques prove to be less successful than forecast, then instructional technologists have failed to warn those practicing this instruction. In either case, instructional technologists do not seem to be well-informed about an issue which concerns our profession. We may be overlooking an emergent technology which many respected scientists and scholars believe can profoundly affect human capabilities. The titles of related books are indicative of that: Superlearning, Supermind, No Limits to Learning, The Farther Reaches of Human Nature, The Possible Human, and Beyond Health and Normality: Explorations of Exceptional Well-Being.

Instructional technologists are not actively exploring a technology which many scholars and educational practioners believe can profoundly affect human capabilities. While it is unthinkable in any profession to adopt a new technology without first examining the best evidence available regarding its potential, isn't it equally imprudent to dismiss a technology without first asking those same questions?

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